

REMARKS

The Official Action dated November 4, 1994 has been carefully considered. Accordingly, the changes presented herewith, taken with the following remarks, are believed sufficient to place the present application in condition for allowance. Reconsideration is respectfully requested.

By the present Amendment, the specification has been amended to correct a typographical error. One of ordinary skill in the art will recognize that the upper limit for the fluorine substituent must be 17 when 8 carbon atoms and 1 iodine atom are included in the formula. Also by the present Amendment, claims 141-156 have been cancelled and claims 157-179 have been added, care having been exercised to avoid any introduction of new matter. Claims 157 and 169 contain limitations from original claims 141 and 156, respectively, and further recite that a fire-extinguishing amount of the fire-extinguishing agent is discharged from the discharge apparatus and that the agent comprises an azeotropic or near azeotropic blend of the fluoroiodocarbon and at least one additive, in accordance with the teachings of the specification, for example at page 12, lines 14-22 and page 17, lines 13-32. Claims 158-168 contain limitations from original claims 142, 144, 145, 147-149 and 151-155, respectively. Claims 170 and 177 contain limitations from original claims 141 and 156, respectively, and original claim 144. Finally, claims 171, 172, 173 and 174-176 contain limitations from

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original claims 142, 145-150, 151-152 and 153-155, respectively. Since these changes do not involve any introduction of new matter, entry is believed to be in order and is respectfully requested.

In the Official Action, claims 141-156 were rejected under 35 USC 112, second paragraph, as being indefinite. The Examiner stated that independent claim 141 was unclear in reciting a blend and independent claims 141 and 156 were indefinite because they did not contain a statement that a fire-extinguishing amount of the fire-extinguishing agent is used.

Applicants submit that claims 157-177 submitted herewith particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. Specifically, each of independent claims 157, 169, 170 and 177 specifically recites that the fire-extinguishing agent comprises a blend of a fluoriodocarbon and at least one additive. Additionally, each of these independent claims also recites that a fire-extinguishing amount of the fire-extinguishing agent is discharged from the discharge apparatus. It is therefore submitted that the rejection under 35 USC 112, second paragraph, has been overcome. Reconsideration is respectfully requested.

Claim 143 was rejected under 35 USC 112, fourth paragraph, as being of improper dependent form. The Examiner stated that the further limitation of "additives" in claim 143 did not further limit claim 141 which recited the use of a blend.

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As noted above, each of the independent claims 157, 169, 170 and 177 now recites that the fire-extinguishing agent comprises a blend of a fluoriodocarbon and at least one additive. Additionally, claim 143 has been cancelled from the application and no corresponding new dependent claim solely reciting the use of an unspecified additive is now presented. It is therefore submitted that the rejection under 35 USC 112, fourth paragraph, has been overcome. Reconsideration is respectfully requested.

Claims 141-143 and 156 were rejected under 35 USC 102(b) as being anticipated by the Dale U.S. Patent No. 3,480,545. The Examiner stated that Dale teaches a method of controlling the spread of fires by employing a flame inhibiting gel composition comprising a halogenated saturated or halogenated unsaturated carbon or hydrocarbon and a gelling agent selected from napalm soaps.

However, as will be set forth in detail below, Applicants submit that claims 157-177 are not anticipated by and are patentably distinguishable from the teachings of Dale. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

The present invention is directed to methods of using a fire-extinguishing agent. Accordingly to claims 157 and 169, the methods comprise providing a fire-extinguishing agent comprising an azeotropic blend or near azeotropic blend (i.e., a blend wherein

the difference in vapor pressures of the components at room temperature is less than 10 psi) of a fluoriodocarbon and at least one additive in a discharge apparatus, and discharging a fire-extinguishing amount of the fire-extinguishing agent from the discharge apparatus. In accordance with claim 169, the fluoriodocarbon is selected from a specified group of compounds. In accordance with claims 170 and 177, the methods comprise providing a fire-extinguishing agent comprising a blend of a fluoriodocarbon and at least one additive selected from the group consisting of hydrofluorocarbons, perfluorocarbons and fluoroethers in a discharge apparatus, and discharging a fire-extinguishing amount of the fire-extinguishing agent from the discharge apparatus. Claim 177 also specifies that the fluoriodocarbon is selected from a specified group of compounds.

Dale discloses a method for controlling the spread of fire by applying a viscoelastic, flame inhibiting gel composition having a halogenated hydrocarbon and a gelling amount of a mixture of aluminum soaps. Dale discloses a number of suitable halogenated compounds which include, inter alia, 1,1,2,2,2-tetrafluoro-1,2-diiodoethane and 1,1,1-trifluoro-2,2,2-fluoro-2-iodoethane. Dale provides no specific example of any composition which employs a fluoriodocarbon compound.

Thus, in contrast to the methods of claims 157 and 169 which employ an azeotropic or near azeotropic blend, i.e. a liquid blend,

of a fluoriodocarbon and at least one additive, Dale discloses gel compositions which are viscoelastic in nature. One of ordinary skill in the art will recognize that the gel compositions of Dale are not azeotropic blends as set forth in claims 157 and 171. Because the claimed methods employ azeotropic or near azeotropic blends, the fire-extinguishing agent evaporates cleanly, with no remaining residues. One of ordinary skill in the art will appreciate that the viscoelastic gels of Dale do not exhibit this clean evaporation feature.

Anticipation under 35 USC 102 requires the disclosure in a single prior art reference of each element of the claims under consideration, Alco Standard Corp. v. TVA, 1 USPQ 2d 1337 (Fed. Cir. 1986). In view of the failure of Dale to disclose methods employing azeotropic or near azeotropic blends as set forth in claims 157 and 169, Dale does not disclose each element of claims 157-169 and therefore does not anticipate these claims under 35 USC 102.

Moreover, while claims 170 and 177 relate to methods which employ a blend of a fluoriodocarbon and at least one additive selected from the group consisting of hydrofluorocarbons, perfluorocarbons and fluoroethers, Dale provides no specific teachings relating to methods employing such blends. In fact, Dale provides no specific teaching relating to any methods employing a

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fluoriodocarbon or employing an additive as recited in claims 170 and 177.

A prior art disclosure of a generic method encompassing a vast number of embodiments, including an Applicant's claimed invention, does not by itself describe Applicants' claimed invention within the meaning of 35 USC 102; rather, such a prior art reference must further provide a more specific, limited teaching relating to the claimed invention in order to anticipate the same, In re Petering, 133 USPQ 275 (CCPA 1962); In re Ruschig, 145 USPQ 274 (CCPA 1965); In re Arkley, 172 USPQ 524 (CCPA 1972). Thus, the broad teachings of Dale, in the absence of a more specific, limiting teaching relating to methods employing blends as recited in claims 170 and 177, do not anticipate the methods of claims 170-177.

It is therefore submitted that the methods defined by claims 157-177 are not anticipated by Dale and are patentably distinguishable therefrom, whereby the rejection under 35 USC 102 has been overcome. Reconsideration is respectfully requested.

Claims 144 and 152-154 were rejected under 35 USC 103 as being unpatentable over Dale, optionally in view of the Nimitz et al. U.S. Patent No. 5,102,557 or the Robin et al. U.S. Patent No. 5,117,917. The Examiner stated that Dale does not directly teach mixtures of fluoriodocarbons with another halogenated fire-extinguishing agent selected from hydrofluorocarbons, perfluorocarbons or fluorocarbons, although Dale teaches

hydrofluorocarbons and perfluorocarbons as individually effective fire-extinguishing agents. The Examiner relied on Nimitz et al. as teaching fire-extinguishing compositions comprising mixtures of halogenated alkanes selected from hydrofluorocarbons and perfluorocarbons and the use of iodine containing halogenated alkanes are fire-extinguishing agents, and Robin et al. as teaching fire-extinguishing compositions using perfluorocarbons, optionally in a mixture with hydrohalocarbons. The Examiner asserted that the claimed invention is obvious over Dale because mixtures of different halogenated carbons and halogenated hydrocarbons are well known in the art and use of two or more materials in combination for the same purpose for which they are taught as being individually useful is not patentable. The Examiner combined Nimitz et al. and Robin et al. to establish that it is well known in the art to make mixtures of different halogenated fire-extinguishing agents.

However, as will be set forth in detail below, it is submitted that the methods defined by claims 157, 169, 170 and 177 are nonobvious over and patentably distinguishable from Dale, alone or in combination with Nimitz et al. and Robin et al. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

First, with respect to claims 157 and 169, the deficiencies of Dale are discussed in detail above. Specifically, Dale fails to

teach or suggest methods employing a fire-extinguishing agent which comprises an azeotropic or near azeotropic blend of a fluoriodocarbon and at least one additive. In fact, Dale teaches away from the use of azeotropic blends of liquids in disclosing that the compositions employed therein are gel compositions. Similarly, Dale provides no teaching or suggestion relating to methods employing fire extinguishing agents which evaporate cleanly. Moreover, neither Nimitz et al. nor Robin et al. resolve the deficiencies of Dale in this regard.

More particularly, while Nimitz et al. disclose fire-extinguishing agents comprising partially or completely fluorinated alkanes having at least two carbon atoms, Applicants find no teaching or suggestion by Nimitz et al. relating to azeotropic or near azeotropic blends of the halogenated alkanes, particularly with a fluoriodocarbon compound. In fact, Nimitz et al. teach away from the use of iodine-containing compounds as fire-extinguishing agents at column 1, lines 45-47 owing to toxicity and stability. On the other hand, Applicants have determined that azeotropic or near azeotropic blends of a fluoriodocarbon and at least one additive are particularly useful as fire-extinguishing agents in that the blends may be less expensive as compared with the agents taught by Nimitz et al. Additionally, the azeotropic or near azeotropic blends as defined by claims 157 and 169 retain their composition at all times and do not fractionate into separate

components, thereby cleanly evaporating without leaving a residue. Nimitz et al. do not teach these features and thus do not resolve the deficiencies of Dale.

Robin et al. disclose completely fluorinated saturated C2, C3 and C4 compounds for use alone or in blends with other compounds. However, Applicants find no teaching or suggestion by Robin et al. relating to azeotropic or near azeotropic blends of the compounds set forth therein with other compounds, particularly with fluoriodocarbons. In fact, Robin et al., like Nimitz et al., teach away from the use of iodine-containing compounds as fire-extinguishing agents. Specifically, at column 1, beginning at line 35, Robin et al. teach away from the use of iodine-containing compounds as fire-extinguishing agents owing to their expense and toxicity considerations. Thus, Robin et al. do not resolve the deficiencies of Dale.

It is therefore submitted that the methods of claims 157-169 employing azeotropic and near azeotropic blends of a fluoriodocarbon and at least one additive are nonobvious over and patentably distinguishable from Dale, alone or in combination with Nimitz et al. and/or Robin et al. Similarly, Applicants submit that the methods defined by claims 170-177 are also nonobvious over and patentably distinguishable from Dale, alone or in combination with Nimitz et al. and/or Robin et al.

More particularly, claims 170 and 177 are directed to methods of using a fire-extinguishing agent comprising a fluoriodocarbon and at least one additive selected from the group consisting of hydrofluorocarbons, perfluorocarbons and fluoroethers. The deficiencies of Dale with respect to these claims is discussed above. Specifically, Dale provides not specific teaching relating to any compositions containing a fluoriodocarbon and provides no specific teaching or suggestion relating to compositions comprising a mixture of a fluoriodocarbon and an additive selected from the group consisting of hydrofluorocarbons, perfluorocarbons and fluoroethers. Rather, the blends of Dale are directed to a halogenated compound and an aluminum napalm soap.

The Examiner's assertion that to employ two or more materials in combination for the same purpose for which they are taught as being individually useful is not patentable is correct. However, this assertion is not pertinent to an obviousness rejection of claims 170-177 based on Dale, since Dale provides no specific teaching or suggestion relating to the use of hydrofluorocarbons, perfluorocarbons or fluoroethers in fire-extinguishing agents.

Moreover, the deficiencies of Dale with respect to the methods of claims 170-177 are not resolved by Nimitz et al. or Robin et al. That is, as noted above, both Nimitz et al. and Robin et al. teach away from the use of iodine-containing compounds in fire-extinguishing agents. Thus, it would not be obvious to one of

ordinary skill in the art to combine any of the fire-extinguishing agents taught in these references with a fluoriodocarbon compound. It is error to find obviousness where references diverge from and teach away from the invention at hand, In re Fine, 5 USPQ 2d 1596 (Fed. Cir. 1988). Thus, the methods defined by claims 170-177 are nonobvious over and patentably distinguishable from the teachings of Dale, alone or in combination with Nimitz et al. and Robin et al.

It is therefore submitted that the methods defined by claims 157-177 are nonobvious over and patentably distinguishable from Dale, alone or in combination with Nimitz et al. or Robin et al., whereby the rejection under 35 USC 103 has been overcome. Reconsideration has been respectfully requested.

Claims 145-151 were rejected under 35 USC 103 as being unpatentable over Dale in view of the Nimitz et al. publication entitled "Next-Generation High-Efficiency Halon Alternatives", optionally in view of either Nimitz et al. or Robin et al. The Examiner stated that although Dale does not directly teach the claimed species of fluoriodocarbon, namely trifluoriodomethane, the Nimitz et al. publication teaches various species of fluoriodocarbons, including trifluoriodomethane, as useful fire-extinguishing agents. The Examiner asserted that it would have been obvious to use trifluoriodmethane in the compositions of Dale.

However, as will be set forth in detail below, it is submitted that the methods defined by claims 157-177 are nonobvious over and patentably distinguishable from the combination of Dale and the Nimitz et al. publication, alone or in further combination with Nimitz et al. and Robin et al. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

The deficiencies of Dale, alone or in combination with Nimitz et al. and Robin et al. are discussed above. Specifically, Dale fails to teach or suggest azeotropic or near azeotropic blends as are employed in the methods of claims 157-169 or blends comprising a fluoroiodocarbon and at least one additive selected from the group consisting of hydrofluorocarbons, perfluorocarbons and fluoroethers as are employed in the methods of claims 170-177. Moreover, Nimitz et al. and Robin et al. do not resolve the deficiencies since these reference similarly fail to teach or suggest the use of azeotropic blends, particularly containing a fluoroiodocarbon, and teach away from the use of iodine-containing compounds as fire-extinguishing agents.

The Nimitz et al. publication does not resolve these deficiencies. That is, while the Nimitz et al. publication discloses several fluoroiodocarbons which were being considered for use as fire-extinguishing agents, the Nimitz et al. publication provides no teaching or suggestion for combining the fluoroiodocarbons discussed therein in an azeotropic blend or with

a hydrofluorocarbon, perfluorocarbon or fluoroether for use in fire-extinguishing methods. To the contrary, the other references relied on by the Examiner, namely Nimitz et al. and Robin et al., teach away from the use of iodine-containing compounds as fire-extinguishing agents owing to their toxicity and expense. Thus, there is no motivation for one of ordinary skill in the art to combine the fluoroiodocarbons of either the Nimitz et al. publication or Dale with the fire-extinguishing compounds taught by Nimitz et al. and Robin et al. Rather Nimitz et al. and Robin et al. teach away from such a combination. As noted above, it is error to find obviousness where references diverge from and teach away from the invention at hand, In re Fine, supra.

It is therefore submitted that the methods defined by claims 157-177 are nonobvious over and patentably distinguishable from Dale in combination with the Nimitz et al. publication, alone or in further combination with Nimitz et al. and Robin et al., whereby the rejection under 35 USC 103 has been overcome. Reconsideration is respectfully requested.

Finally, claim 155 was rejected under 35 USC 103 as being unpatentable over Dale in view of the Uchida et al. U.S. Patent No. 4,459,213. The Examiner stated that Dale differs from the claimed invention in not directly teaching the use of a fluoroether as an additive to the fire-extinguishing compositions. The Examiner relied on Uchida et al. as teaching a fire-extinguishing

composition comprising a protein, a polyhydroxy compound, halogenated hydrocarbons and halogenated carbons, and optional adjuvants such as surfactants, including fluorine surface active agents. The Examiner asserted that it would have been obvious in view of Uchida et al. to include a fluorine surface active agent in the composition taught by Dale.

However, as will be set forth in detail below, it is submitted that the methods defined by claims 157-177 are nonobvious over and patentably distinguishable from the cited combination of references. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

The deficiencies of Dale with respect to the presently claimed methods are noted above. Specifically, Dale provides no teaching or suggestion relating to methods employing an azeotropic or near azeotropic blend of a fluoroiodocarbon and at least one additive as employed in the methods of claims 157-169 or relating to blends of a fluoroiodocarbon and at least one additive selected from the group consisting of hydrofluorocarbons, perfluorocarbons and fluoroethers as employed in the methods of claims 170-177. Moreover, Uchida et al. do not resolve these deficiencies in the teachings of Dale.

More particularly, Uchida et al. disclose a fire-extinguishing composition comprising a blend of a protein or protein decomposition product, a liquid polyhydroxy compound or an aqueous

solution of such a compound, and at least one halogenated hydrocarbon. At column 3, beginning at line 29, Uchida et al. disclose that the fire-extinguishing composition may further contain a surface active agent. Numerous surface active agents are then set forth beginning at column 3, line 34 and continuing through column 4, line 3 including, inter alia, fluorine surface-active agents. Applicants find no further teaching by Uchida et al. relating to specific fluorine surface-active agents. Particularly, Applicants find no teaching or suggestion by Uchida et al. relating to compositions containing a fluoroether as recited in original claim 155 or present claim 176. Additionally, Applicants find no teaching or suggestion by Uchida et al. relating to any fire-extinguishing composition in the form of an azeotropic or near azeotropic blend, particularly of a fluoriodocarbon, as employed in the methods of claims 157-169, or relating to blends of a fluoroether with a fluoriodocarbon as employed in the methods of claims 170-177. Moreover, Uchida et al., like Dale, fail to disclose methods employing a cleanly evaporating fire-extinguishing agent. One of ordinary skill in the art will recognize that the agents of Uchida et al. will not evaporate cleanly. Thus, Uchida et al. do not resolve the deficiencies of Dale.

In order for a combination of references to render an invention obvious, the combination of the teachings of all or any of the references must suggest, expressly or by implication, the

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possibility of achieving further improvement by combining such teachings along the lines of the invention, In re Sernaker, 217 USPQ 1 (Fed. Cir. 1983). Moreover, it is impermissible to first ascertain factually what Applicants have done and then view the prior art in such a manner as to select from the random facts of that art only those which may be modified and then utilized to reconstruct the claimed invention from such prior art, In re Shuman, 150 USPQ 54 (CCPA 1966). Applicants find no suggestion, express or implied, relating to any possibility of achieving further improvement by combining the teachings of Dale and Uchida et al. along the lines of the present invention. Thus, the combination of Dale and Uchida et al. do not render the presently claimed invention obvious.

It is therefore submitted that the methods defined by claims 157-177 are nonobvious over and patentably distinguishable from the combination of Dale and Uchida et al., whereby the rejection under 35 USC 103 has been overcome. Reconsideration is respectfully requested.

It is believed that the above represents a complete response to the Examiner's rejections under 35 USC 102, 103 and 112, and places the present application in condition for allowance. Reconsideration and an early allowance are requested.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage

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in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 12-2237 and please credit any excess fees to such deposit account.

Respectfully submitted,

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